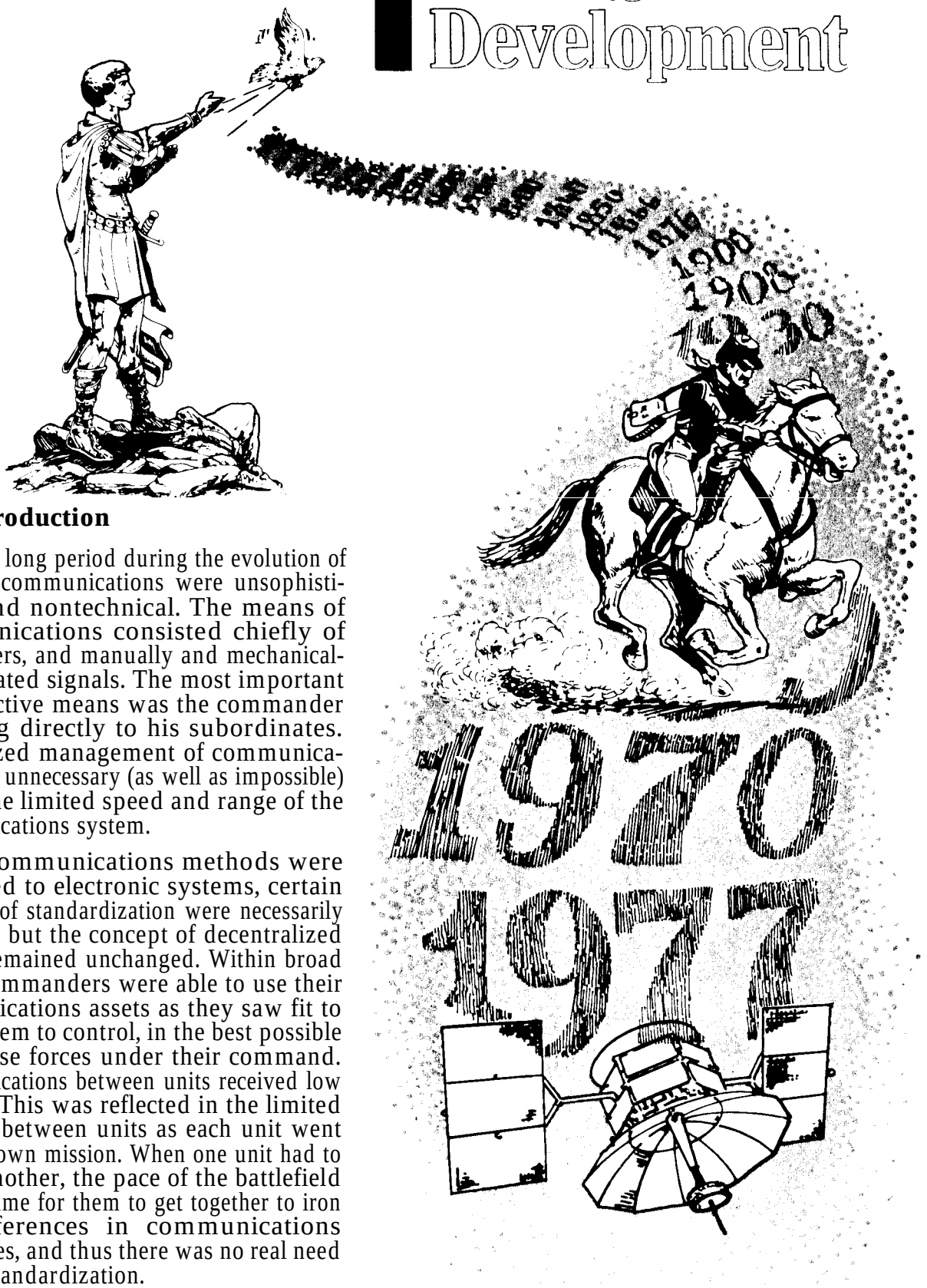
Chapter 1

C-EMS Development



1-1. Introduction

For a long period during the evolution of warfare, communications were unsophisticated and nontechnical. The means of communications consisted chiefly of messengers, and manually and mechanically generated signals. The most important and effective means was the commander speaking directly to his subordinates. Centralized management of communications was unnecessary (as well as impossible) due to the limited speed and range of the communications system.

As communications methods were converted to electronic systems, certain elements of standardization were necessarily imposed, but the concept of decentralized control remained unchanged. Within broad limits, commanders were able to use their communications assets as they saw fit to enable them to control, in the best possible way, those forces under their command. Communications between units received low priority. This was reflected in the limited interface between units as each unit went about its own mission. When one unit had to talk to another, the pace of the battlefield allowed time for them to get together to iron out differences in communications procedures, and thus there was no real need for C-E standardization.

a. Doctrine for the allocation and employment of tactical C-E resources called for every commander to be provided with the resources he needed to communicate with his subordinate commanders one echelon below. That commander, in turn, had the assets to communicate one echelon lower. The communications network paralleled the command structure. Doctrinal responsibility then existed from higher to lower units and also from right to left on the battlefield. At every echelon, more than one means of communications were provided. Every signal unit was organized with the goal of providing a self-contained, dependable, flexible, secure, and rapid communications capability.

b. The structure developed for management of the C-E system was much the same at each echelon. Each commander had a subordinate signal unit to operate his communications system and a staff officer to advise him. Management functions were divided between the staff and the subordinate signal unit. To enable each commander to employ communications as he saw fit, decentralized control at each echelon was practiced.

1-2. The Need for C-EMS

With the introduction of electronics to communications, the battlefield environment changed. The demands placed upon communications also dramatically changed. Time is a most important factor and distance becomes less and less significant. With increases in mobility and technology, units now move more quickly and shoot more accurately; thus, commanders must be able to exercise pinpoint control. New administrative and logistics systems require the transmission of large amounts of data to support the commander. Subscribers must now communicate throughout the width and depth of the battlefield. The intensifying requirements for dependability, flexibility, speed, security, and volume capacity increased as mobility on the battlefield caused interdependence among units. Interface between units and between their communications systems became a major concern.

To meet the demands of today's Army, highly sophisticated C-E equipment is required. To provide voice, teletypewriter, facsimile, or data communications across the battlefield, high capacity trunk systems, tactical automatic voice, and data transmission systems are being fielded. To maximize their capabilities and to meet the total communications requirement, all of these systems must be integrated at every level.

1-3. The Design of C-EMS

For successful integration of these systems, technical and managerial standardization must be imposed. A commander no longer operates his own communications without concern for systems integration. To do so would degrade not only his portion but also the entire network. Decentralized control is, therefore, no longer an acceptable management practice. For efficient and effective management of the C-E system, centralized control coupled with decentralized implementation is now a necessity.

a. C-EMS is designed to provide centralized control with decentralized execution. The system is capable of monitoring the status of resources and other baseline data necessary for planning and engineering tactical systems. It exercises dynamic technical control over tactical communications systems and coordinates the interfaces with other systems.

b. C-EMS encompasses such functions as the determination of equipment status, disposition and allocation of communications resources, determination of precedence, levels of security access, and equipment

interface capabilities at access points. It also includes the primary technical control functions (monitoring, testing, routing, failure prediction, restoring, and reporting) which must be on a real-time or near real-time basis.

c. C-EMS uses the current inventory equipment but is designed with sufficient flexibility so as to be able to accommodate developmental items as they become available. It will ultimately include those facilities being developed under joint DOD programs which will provide the tactical commander a fully automated systems control capability. Based on future configurations of equipment, acronyms previously associated with management and control are replaced with DOD/DA approved terminology as developed under the joint tactical communications program (TRI-TAC).

d. C-EMS is designed to cope with the complex mix of secure and nonsecure analog/digital communications equipment. The system will use automatic assistance to facilitate performance analysis and the dissemination of planning, engineering, and control information.